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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,887	12/31/2003	David Dixon	CT-004	8895

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WOOD, HERRON & EVANS, LLP (TOKYO ELECTRON)
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CINCINNATI, OH 45202

EXAMINER

ROSARIO, DENNIS

ART UNIT	PAPER NUMBER
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2624

NOTIFICATION DATE	DELIVERY MODE
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06/19/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<p align="center">Office Action Summary</p>	Application No. 10/749,887	Applicant(s) DIXON ET AL.	
	Examiner Dennis Rosario	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 21-38 and 41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 9, 11, 13-16, 18, 19, 39 and 40 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 10, 12, 17 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/9/04 9/13/04 5/20/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species:

- I. fig. 3 drawn to claims 1-20,39 and 40;
- II. fig. 5 drawn to claims 21-38 and 41.

2. The species are independent or distinct because both species have a different effect in the last limitation of each species.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species.

MPEP § 809.02(a).

3. During a telephone conversation with Joe Jordan on 6/6/07 a provisional election was made without traverse to prosecute the invention of species I, claims 1-20,39 and 40. Affirmation of this election must be made by applicant in replying to this Office action. Claims 21-38 and 41 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4,11,13,14,39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (US Patent 7,035,437 B2) in view of Phan et al. (US Patent 6,784,446 B1).

Regarding claim 1, Yamaguchi teaches a method for inspecting a photolithographically processed wafer, comprising the steps of:

a) determining a first image signature (fig. 5: IR DATA) of a golden wafer using a first lamp at a first intensity (via "LEDs" in col. 3, line 26);

b) determining a second image signature (fig. 5: VISIBLE IMAGE (RGB) DATA) of the processed wafer using a second lamp (said LEDs) at a second intensity;

- c) adjusting the first image signature (fig. 5: CORRECTION OF IR DATA) based on a difference (fig. 5, step 1: SUBTRACTING) between the first intensity and the second intensity to generate an adjusted golden wafer signature; and
- d) generating a defect confidence value (fig. 5, step 5: DETECT...FLAW) by comparing the second image signature with the adjusted golden wafer signature.

Yamaguchi does not teach the claimed wafer, but does teach the invention is not limited and can use a "reflecting original such as a printed material" in col. 10, lines 48,49.

Phan teaches the printed material as show in fig. 2,num. 210 as suggested by Yamaguchi and the remaining limitation of the claim wafer as shown in fig. 2,num. 210.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Yamaguchi's teaching of using a printed material with Phan's printed material, because Yamaguchi's invention can detect defects in a plurality of different types of objects such as film and printed materials and is not just limited to one type of object.

Claim 2 is rejected the same as claim 1, paragraph b). Thus, argument similar to that presented above for claim 1b) is equally applicable to claim 2.

Claim 3 is rejected the same as claim 2. Thus, argument similar to that presented above for claim 2 is equally applicable to claim 3.

Regarding claim 4, Yamaguchi of the combination teaches the method according to claim 3, wherein the difference is substantially equal to the respective green value of the second image signature subtracted from the respective green value of the first image signature (when using "one color...[to obtain a]....difference between [said] color" in col. 9, lines 54-56.

Claim 11 is rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 is equally applicable to claim 11.

Claims 13 and 14 are rejected the same as claims 3 and 4. Thus, argument similar to that presented above for claims 3 and 4 is equally applicable to claims 13 and 14, respectively.

Claims 39 and 40 are rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 is equally applicable to claims 39 and 40 except for the additional limitation of a medium as taught in Yamaguchi in fig. 3,num. 48.

6. Claims 8,9,18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (US Patent 7,035,437 B2) in view of Phan et al. (US Patent 6,784,446 B1) as applied to claims 1 and 11 above, and further in view of Hamamatsu et al. (US Patent Application Publication No.: 2004/0105093 A1).

Regarding claim 18, the combination of Yamaguchi and Phan does not teach claim 18, but Yamaguchi teaches that the LEDs can be replaced using a “white light source such as a halogen lamp” in col. 4, lines 32,33. Thus, Yamaguchi suggests to one of ordinary skill in the art of light sources that a plurality of light sources can be used with the invention.

Hamamatsu teaches an “illumination light beam” in paragraph [0028], lines 7,8 as suggested by Yamaguchi and claim 18 of:

a) selecting the second intensity (fig. 5, num. 511) based on an inspection recipe (fig. 5, num. 507).

Regarding claim 19, Hamamatsu teaches the method according to claim 18, wherein the inspection recipe identifies the first intensity (fig. 5, num. 516).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Yamaguchi’s teaching of using a light source with Hamamatsu’s teaching of the light beam, because Hamamatsu’s teaching provides an “efficient use of illumination energy” in [0028], lines 10,11.

Claims 8 and 9 are rejected the same as claims 18 and 19. Thus, argument similar to that presented above for claims 18 and 19 is equally applicable to claims 8 and 9, respectively.

7. Claims 5,15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (US Patent 7,035,437 B2) in view of Phan et al. (US Patent 6,784,446 B1) as applied to claim 1 above, and further in view of Mueller et al. (US Patent Application Publication No.: 2004/0052076 A1).

Regarding claim 5, Yamaguchi of the combination teaches the method according to claim 4, further comprising the steps of:

a) determining a respective RGB signature (or determining “any color or R,G, and B” in col. 9, lines 51,52) of the golden wafer at each of a plurality of different setting values (corresponding to “types of carriers” in col. 3, line 48) using the first lamp.

The combination of Yamaguchi and Phan does not teach the remaining limitations of claim 5, but Yamaguchi teaches that the LEDs can be replaced using a “white light source such as a halogen lamp” in col. 4, lines 32,33. Thus, Yamaguchi suggests to one of ordinary skill in the art of light sources that a plurality of light sources can be used with the invention.

Mueller teaches a light source as shown in fig. 2, numerals 100 as suggested by Yamaguchi and the remaining limitations of claim of:

a) calculating a red slope (or “rate of change” in paragraph [0282], lines 26,27 corresponding to a “color change” in [0282], line 25 that includes “red, green, blue” in [0050], line 3) corresponding to a change in the respective red values as compared to a change in the setting values (via a “dimmer” in [0282], line 26 that initiates the color change thus producing a rate of change or the claimed slope);

b) calculating a green slope corresponding to a change in the respective green values as compared to a change in the setting values; and

c) calculating a blue slope corresponding to a change in the respective blue values as compared to a change in the setting values (the last two limitations b) and c) are rejected for similar reasons of the rejection of claim 5, paragraph a).)

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Yamaguchi's teaching of using a light source with Mueller's teaching of the light source of fig. 2, numerals 100, because Mueller's teaching can be used in a wide variety of useful applications as discussed in [0270]-[0272] such as "analysis or inspection" in [0270], lines 16,17.

Claims 15 and 16 are rejected the same as claim 5. Thus, argument similar to that presented above for claim 5 is equally applicable to claims 15 and 16.

Allowable Subject Matter

8. Claims 6,7,10,12,17 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Claim 6 is allowable because the prior art does not teach normalizing the red slope with respect to the green slope.

Claim 7 is allowable for depending on an objected allowable parent claim.

Claim 10 is allowable because the prior art does not teach claim 10.

Claim 12 is allowable because the prior art does not teach calculating an amount to adjust the first RGB signature based on the calculated rate of change and the difference between the first intensity and the second intensity.

The closest prior art, Mueller teaches all the limitations of claim 12 except for the difference between the first intensity and the second intensity.

Claim 17 is allowable for the same reasons as claim 12.

The benefit of claim 6 "compensates for tool-to-tool variability" in the specification, page 12, lines 20,21.

The benefit of claim 10 selects "the appropriate lamp setting" in the specification, page 10, line 16.

The benefit of claim 12 "generates a confidence score related to whether or not a defect exists" in the specification, page 16, lines 5,6.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Qian et al. (US Patent 7,043,071 B2) is pertinent as teaching a method of correcting a reference image as shown in fig. 2A, num. 251. However, Qian does not provide enough details about light.

Schott (US Patent 5,850,566) is pertinent as teaching of method of using a golden template, but is lacking in details of a light.

Esrig et al. (US Patent 5,640,237) is pertinent as teaching a method of using a golden wafer in fig. 6, num. 70, but the golden wafer is not adjusted based on a difference between wafers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 9-5.

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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